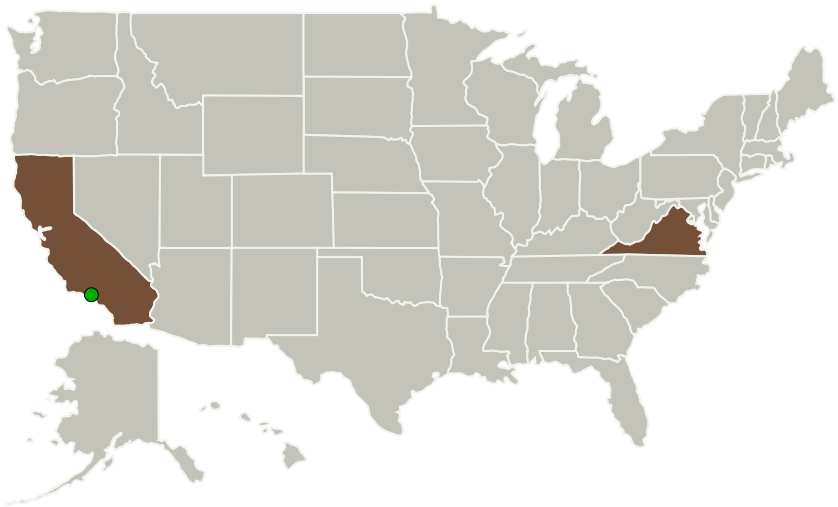
Robust Load Cell Cell for Discrete Contact Force Measurements of Sampling Systems and/or Instruments, Phase I

Completed Technology Project (2010 - 2010)

Project Introduction

Bear Engineering proposes to develop a simple, robust, extreme environment compatible, mechanical load cell to enable the control of contact forces for placement of sampling systems and instruments against target locations. The load cell will be used to provide preset preloads and dynamically control the reaction force to a platform upon which a sampling system or instrument is mounted. The novel device has been designed to work solely by mechanical means using spring preloaded electrical contacts to create 6, 9, 12 or 18 discrete load sensing levels, depending on design parameters. When any of the load thresholds has been reached, the corresponding electrical contact changes state from normally open or normally closed. The load cell is completely sealed and has similar size, shape and strain displacements as traditional strain gage load cells. It is expected that this new design will have a diameter ranging from 2 to 3 inches (depending on designed force level) and a thickness of about ½ to 1 inch. Strain displacement at full load is expected to be about 0.003 inch. For future Mars, Venusian or other planetary sampling missions, the robust load cell would be a key component in ensuring and maintaining proper contact with rocks or samples of interest and it will be developed to TRL 4 at the end of the proposed effort. A potential Phase 2 will advance the design to TRL 6.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Bear Technologies, LLC	Lead Organization	Industry Small Disadvantaged Business (SDB)	Oilville, Virginia
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Virginia

Project Transitions

January 2010: Project Start

July 2010: Closed out

Closeout Summary: Robust Load Cell Cell for Discrete Contact Force Measure ments of Sampling Systems and/or Instruments, Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139416)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Bear Technologies, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

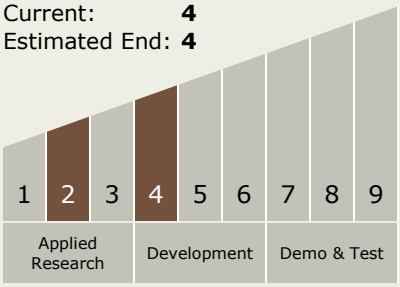
Carlos Torrez

Principal Investigator:

Tom Myrick

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.2 Energy Storage
    - TX03.2.2 Electrochemical: Fuel Cells

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System